SECOND PROGRESS REPORT

SAN JOAQUIN PROJECT

Northfork, Cal.
February 9, 1924.

Hubert L. Person
Junior Entomologist.

Entomologist

SECOND
PROGRESS REPORT - SAN JOAQUIN PROJECT

The conditions, purpose and methods of the project have been covered to date in two previous reports titled, "First Annual Report - May 1921," and "Revised Working Plan - April 1922."

The progress of the project thru the seasons of 1920 and 1921 and the cost figures for the season of 1922 were given in the "Progress Report - April 1923".

The results of the control work for the season 1922 and the cost figures for the season of 1923 are now available. The total 1923 loss and the effect of the 1923 control work will not become evident until after the spring cruising of 1924 is complete.

The total volume treated and the cost of the project to date are given in Table I.

The total annual loss by districts from 1919 to 1923 is shown in Table III. These losses are based on a 100% topographic cruise, made by the same man each year.

Results of Control Work - Season of 1922:

A discussion of the plan of control work adopted during this season and the cost figures were given in the Progress Report of April 1923.

It became evident that the infestation was increasing in the fall of 1921. In the control work of that season less than 50% of the total infestation was treated and it was evident that this amount of work was of small value in checking the increase. In the Chiquito district where mainly summer work with trap trees was carried on this increase amounted to 120%. In the Northfork district where a larger volume of spring work had been carried out the increase was 60%.

In 1922 the work was concentrated on 20,000 acres in the Chiquito district with the purpose of determining upon an experimental basis the amount of control work required to check this increase. No work was carried out in the Northfork district which was left as a check. The results of this season's work now available are as follows:

> The infestation continued to increase but in varying degree on both the control area and the check area. The loss over the entire project for this year was the highest on record, 5,264,690 board feet.
>
> On the area covered by control the increase amounted to 20%.
>
> On the check area (entire Northfork district) the increase amounted to 132%.

Had the increase on the control area been the same as that on the check area the increase over the 1921 loss in board feet would have been 1,091,000 instead of 167,000. On this basis the apparent saving of 924,000 board feet

represents the return on $3,062.26 invested in control work in 1922. However, due to the experimental phases of the work this cost on certain units was much higher than would have been necessary if different methods were not being tested out.

The results on the individual units within the control area varied according to the intensity of the methods used. On the Forked Meadow unit where the most intensive work was applied, there not only was no increase but an actual reduction was secured.

Before theye can be properly interpreted these results should be subjected to a much more detailed analysis which can be made to the best advantage after the control work on the project is closed up in 1924.

Control Work - Season of 1923:

During this season the work was limited to the control of only four units, an area of about 20,000 acres. Since trap trees had proven very expensive as well as ineffective during the preceding season their use was discontinued, although all of the traps felled in the fall of 1922 were treated as fast as they became infested.

A summary of the work done and the costs on each of these units is given in Table IV.

26a. - Logans. Spring and summer work without trap trees.

Both the overwintering and the summer generations were well worked and the unit should show a marked reduction in infestations.

26b. - Forked Meadow Extermination Unit.

This area was cruised regularly at short intervals and all the infestation treated as soon as it appeared. This intensive work with high cruising cost accounts for the slightly higher control cost of $9.30 per M.B.M. The large number of trees treated in 1923 (116) in spite of the intensive control work of 1922 is largely accounted for by the fact that Jeffrey pine trees infested with flatheads were not treated in 1922 but were treated in 1923. As all of the control work has been directed against D.brevicomis and D.monticolae the flathead trees were treated in 1923 only to eliminate red-top trees from the unit to aid in locating newly attacked trees. The flathead trees are usually small, scrubby trees on exposed, rocky sites and represent very little value. In 1922, out of 143 standing trees treated, 112 were D.b. or D.m. trees while in 1923 out of 116 standing trees treated only 60 were D.b. or D.m. infested, so that the D.b., D.m., infestation in standing trees decreased 46%. Since the amount of infestation in traps was much greater in 1922 than in 1923 the actual decrease in infestation was even greater.

The reason for the persistence of this infestation under extermination methods is undoubtedly due to the beetles coming in from the bordering check areas especially unit 27, immediately adjoining, which has a rather heavy infestation.

It is evidently impossible to exterminate the beetles from a small area which is not completely isolated.

26c. - West Chiquito, Spring and Summer Work Without Trees.

This unit was not worked as thoroughly as 26a. although a fairly high percent of the infestation was treated.

26d.- Arnold.

Both spring ans summer work was carried on in the southern half of this unit only. It was not worked as thoroughly as the other three control units.

Plans for Season of 1924.

Chiquito District-

The control work will be concluded during this season as it is believed that enough has been done to bring out certain definite facts in regard to maintenance control. The analysis of records will not be attempted until after the completion of all the control work. The same four units that were worked in 1923, 26a, 26b, 26c, and 26d, will be worked during the season. As the infestation is evidently declining only two men besides the foreman will be used thru the entire season. The extermination work on 26b will be the first consideration and as much of the infestation will be worked on the other units as the time allows.

Northfork District-

During the past few years a number of the large sugar pine in and near Ellis Meadow have been killed by the mountain pine beetle, Dendroctonus monticolae. As this area has a high recreational value largely due to this beautiful timber, it is proposed to carry on control work against the mountain pine beetle in and about Ellis Meadow. The work can be done to best advantage by a crew of 6 men and a cook working from May 15 to June 15. It should be possible to cover about 8 sections in that period.

This work is not recommended as part of the experimental features of the project but for reasons of protection only. It has been suggested by the Forest Service for the reason that it is bad policy to let an infestation run in a body of timber with the high values involved in this locality.

While the work will be carried out in a part of the area set aside as a check for the experimental work, it is not considered that it will interfere with the results to be obtained.

Estimates - Season of 1924.

Chiquito District - Fiscal Year 1924.

Foreman Chiquito Crew, April 1 to June 30 ---	$360.00*
Wagner, cruising time, 1 month ----------	136.00*
Wages, 2 men, 3 months ----------	600.00
Subsistence, 3 men, 3 months ----------	270.00
" 1 man, 1 month ----------	30.00
Packing and Incidentals ----------	100.00
Total	$1496.00

* Foreman and cruisers salary amounting to $496.00 will be paid by the Bureau of Entomology, leaving a balance of $900.00 on the fund of $1900.00. The $900.00 to be used for the Ellis Meadow control work as given below.

Northfork District - Ellis Meadow

Wages, 6 men, 1 month ----------	$500.00
Cooks salary, 1 month ----------	100.00
Subsistence, 7 men, 1 month ----------	215.00
Packing and incidentals ----------	85.00
	$900.00

Fiscal Year - 1925

Chiquito Control Work

Foreman Chiquito crew, July 1, to Sept. 30 ---	$360.00*
Wages, 2 men, 3 months ----------	600.00
Subsistence, 3 men, 3 months ----------	270.00
Packing and incidentals ----------	70.00
Total	$1300.00

600
270
70
300
1100

*Foreman salary paid by Bureau of Entomology, leaving $940.00 to be paid by the Forest Service.

Check Cruising

Field expenses, Ranger Wagner ----------	200.00
Total	$1500.00

Season of 1925

The control work, as planned, will be completed during the season of 1924. No work will be done during the spring of 1925 but during the last half of June the Chiquito District will be covered by a careful check cruise to show the total effedt of control work to that time. This cruise will be made by the Bureau of Entomology.

TABLE I

COST OF PROJECT TO DATE

Season	Period	Amount Treated: No. Trees	Amount Treated: Volume	Cost	Cost Per M.B.M.
1920	Spring Work	375	715,450	$4,909.15	$6.86
	Summer Work	338	589,510	2,225.91	$3.78
	Total	713	1,304,960	7,135.06	$5.46
1921	Summer Work	462	694,470	$3,709.07	$5.33
	Total	462	694,470	$3,709.07	$5.33
1922	Spring Work	101	144,530	$864.50	$5.85
	Summer Work	290	275,700	$2,215.76	$8.04
	Total	391	420,230	$3,062.26	$7.25
1923	Spring Work	240	299,140	$1,800.93	$6.02
	Summer Work	176	268,510	$2,030.97	$7.56
	Total	416	567,650	$3,831.90	$6.75

CHARACTER OF TIMBER TREATED

	1920			1921			1922			1923		
	No. Trees	Volume	%	No. Trees	Volume	%	No. Trees	Volume	%	No. Trees	Volume	%
Standing Trees	467	888,280	67	203	451,310	66	278	392,970	93	355	551,060	97
Windfalls	90	209,660	17	44	113,390	16				2	3,500	.6
Trap Trees	156	216,020	16	215	129,770	18	113	27,260	7	59	13,090	2.4
Total	713	1,304,960	100	462	694,470	100	391	420,230	100	416	567,650	100

Table III

San Joaquin Project.

Summary of Annual Losses - Standing Trees Killed 1919 to 1923.

Year	Species	Northfork District		Chiquito District		Totals Both Species	
		No. Trees	Volume	No. trees	Volume	No. trees	Volume
1919	Yellow Pine	719	1,129,190	458	940,640		
	Sugar Pine	72	513,270	99	340,080		
		791	1,642,460	557	1,280,720	1,348	2,923,180
1920	Yellow Pine	439	749,000	244	374,420		
	Sugar Pine	62	271,140	51	156,920		
		500	1,020,140	295	531,340	795	1,551,480
1921	Yellow Pine	569	951,420	434	1,032,050		
	Sugar Pine	158	680,430	48	134,480		
		717	1,631,850	482	1,166,530	1,209	2,798,380
1922	Yellow Pine	888	1,524,900	852	1,281,190		
	Sugar Pine	383	2,268,140	86	190,460		
		1,271	3,793,040	938	1,471,650	2,209	5,264,690
1923 to Dec. 1:	Yellow Pine	~~402~~ 699	~~679,600~~ 1,034,060	~~138~~ 585	~~210,630~~ 846,040		
	Sugar Pine	~~162~~ 239	~~683,830~~ 1,156,750	~~21~~ 81	~~64,750~~ 225,250	1,604	3,262,100
		~~564~~ 938	~~1,363,430~~ 2,190,810	159 666	275,580 1,071,290	~~723~~	~~1,639,010~~

Note: Jeffrey Pine included under Yellow Pine.

133

TABLE III

SAN JOAQUIN INSECT CONTROL PROJECT

STATEMENT OF COSTS - SEASON OF 1923.

Control Work - Chiquito District.
Period - March 25, to October 10, 1923.

Area treated	19,120 Acres.
Stand protected	210,974,000 "
Total cost of control work	$3,831.90
No. of trees treated	416*
Volume (Ft. B.M.)"	567,650
Cost per acre	$.20
Cost per tree	$9.21
Cost per M.B.M. treated	6.75

* Includes 59 trap trees felled 1922, treated 1923.

Detail of Costs.	Spring	Summer	Total
Wages and salaries	1,113.03	1,579.88	2,692.91*
Subsistence	549.60	420.54	970.14
Hire of pack stock	46.87	-	46.87
Feed for pack stock	64.00	-	64.00
Transportation by car(mileage & gas)	14.48	17.60	32.08
Depreciation on equipment	12.95	12.95	25.90
	1,800.93	2,030.97	3,831.90

Total number of man days--788
Total cost per man day--$4.86

* $950.14 provided by Bureau of Entomology.

Assignment of Costs by Activities.				% of Total
Travel				
Time and subsistence of men in going from Northfork to control camp and return	$103.60	$9.26	$112.86	2.9
Packing				
Labor and subsistence	49.05	49.84	98.89	
Hire of stock	46.87		46.87	
Feed for stock	64.00		64.00	6.3
Mileage and gas	14.48	17.60	32.08	
	174.40	87.44	241.84	
Trail and camp improvements				
Labor and subsistence	-	14.48	14.48	.3
Fire fighting (outside of control area)	-	5.22	5.22	.1
Control Work				
Labor and subsistence	1,509.98	1,921.62		
Equipment	12.95	12.95		
	1,522.93	1,934.57	3,457.50	90.3
Total	1,800.93	2,030.97	3,831.90	100.00

Cost of Camp Subsistence

During the spring work one camp of 12 men was maintained and a cook was employed for the period, March 26 to May 3, 1923. For the summer work only two men, besides the foreman, were used and no cook was employed.

	Spring	Summer	Total
Total Cost of Supplies	$422.85	$420.54	$843.39
Cooks salary	126.75		126.75
Total Subsistence Cost	$549.60	$420.54	$970.14
Total No. Man-days in camp	424	445	869
Cost per Man-day	$1.30	$.95	$1.12
Man-days worked	258	313	571
Cost per Man-day worked	$2.13	$1.34	$1.70

CHECK CRUISING - NORTHFORK DISTRICT

Period - May 29, to November 15, 1923.

Area covered	88,320 acres.
Total No. of trees marked	1,435
Total volume marked	3,198,140 ft. B.M.
Total cost of check cruising	$645.82

Detail of Costs

Salaries

Cruising - 96 man-days	$432.00	
Camp moving-2 " "	9.00	
Office work-8 " "	36.00	
Fire fighting 2 " "	9.00	
		$486.00

Field Expense

Subsistence and transportation	$159.82
Total	$645.82

Cooperation

	Forest Service	Bureau of Entomology	Total both Bureaus
Control Work	$2881.76	$950.14	$3831.90
Check Cruising	159.82	486.00	645.82
Total	$3041.58	$1436.14	$4477.72.

Table IV.

Summary Experimental Work - Season of 1923.

Chiquito District - San Joaquin Insect Control Project.

Unit Number	26A	26B	26C	26D	Totals
Name	Logan	Forked Meadow	West Chiquito	Arnold	
Nature of work done	Spring & Summer no traps	Extermination	Spring & Summer no traps	Partial Spring & Summer	
Acreage	5.200	3.320	5.360	5.240	19.120
Stand	43.520.000	36.894.000	69.120.000	61.440.000	210.974.000
Vol. killed 1922	285.080	167.730	302.040	140.080	894.930
Total time on unit Man days	85.80	123.18	89.69	46.84	345.51
% of time on Total area	24.8	35.6	25.9	13.6	100.00
Total Cost	$951.56	$1.366.13	$994.71	$519.48	$3.831.90
Vol. (MM) Treated	134.330	146.890	190.880	95.550	567.650
Cost per MBM "	$7.08	$9.30	$5.21	$5.43	$6.75
Cost per Acre (total)	$.183	$.411	$.185	$.099	$.200
Cruising					
No. trees marked	180	152	213	78	623
Time man days	14.00	14.83	7.04	2.89	38.76
Cost	$155.27	$164.47	$78.08	$32.05	$429.87
Control					
Standing Trees No. treated	88	116	103	50	357
Volume	127.150	140.980	190.880	95.550	554.560
Time man days	54.24	91.35	82.65	43.95	272.19
Total Cost	$601.55	$1.013.12	$916.63	$487.43	$3.018.73
Cost per Tree	$6.83	$8.73	$8.89	$9.75	$8.45
Cost per MBM	$4.73	$7.18	$4.80	$5.11	$5.44
Cost per Acre	$.115	$.305	$.171	$.93	$.158
Trap Trees No. treated	37	22			59
Time man days	17.56	17.0			34.56
Total Cost	$194.70	$188.54			$383.24
Cost per tree	$5.26	$8.39			$6.49
Cost per MBM	$27.12	$31.90			$29.28